Naval Education and Training Command

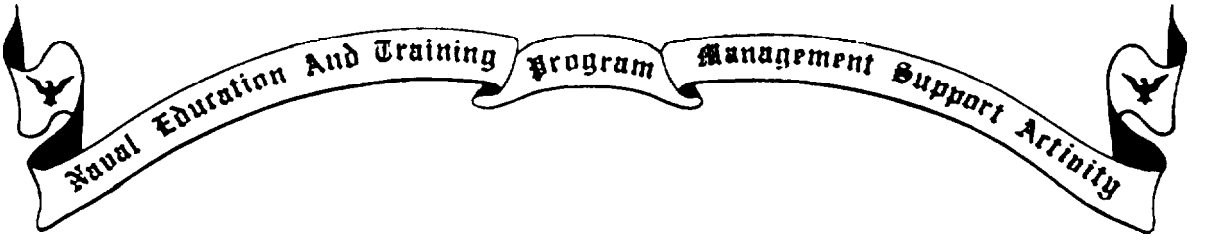
NAVEDTRA 12520
March 1993
0502-LP-220-6200

Training Manual (TRAMAN)

Builder 3 & 2, Volume 1

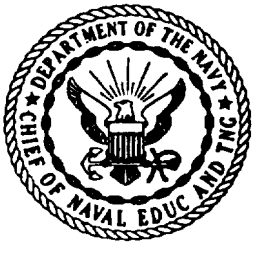
0502LP2206200

Although the words “he,” “hIm;’ and “his” are used sparingly in this manual to enhance communication, they are not intended to be gender driven nor to affront or discriminate against anyone reading this text.



BUILDER 3 & 2, VOLUME 1

NAVEDTRA 12520



1993 Edition Prepared by
BUCS John Buza

PREFACE

This training manual (TRAMAN) and its associated nonresident training course (NRTC) are two units of a self-study program that will enable you, the Builder, to fulfill the requirements of your rating.

Designed for individual study and not formal classroom instruction, this TRAMAN provides subject matter that relates directly to the occupational standards of the Builder rating. The NRTC provides a way of satisfying the requirements for completing the TRAMAN. The assignments in the NRTC are intended to emphasize the key points in the TRAMAN.

This training manual and its nonresident training course were prepared by the Naval Education and Training Program Management Support Activity, Pensacola, Florida, for the Chief of Naval Education and Training.

1993 Edition

Stock Ordering No.
0502-LP-220-6200

Published by
NAVAL EDUCATION AND TRAINING PROGRAM
MANAGEMENT SUPPORT ACTIVITY

UNITED STATES
GOVERNMENT PRINTING OFFICE
WASHINGTON, D.C.: 1993

THE UNITED STATES NAVY

GUARDIAN OF OUR COUNTRY

The United States Navy is responsible for maintaining control of the sea and is a ready force on watch at home and overseas, capable of strong action to preserve the peace or of instant offensive action to win in war.

It is upon the maintenance of this control that our country's glorious future depends; the United States Navy exists to make it so.

WE SERVE WITH HONOR

Tradition, valor, and victory are the Navy's heritage from the past. To these may be added dedication, discipline, and vigilance as the watchwords of the present and the future.

At home or on distant stations as we serve with pride, confident in the respect of our country, our shipmates, and our families.

Our responsibilities sober us; our adversities strengthen us.

Service to God and Country is our special privilege. We serve with honor.

THE FUTURE OF THE NAVY

The Navy will always employ new weapons, new techniques, and greater power to protect and defend the United States on the sea, under the sea, and in the air.

Now and in the future, control of the sea gives the United States her greatest advantage for the maintenance of peace and for victory in war.

Mobility, surprise, dispersal, and offensive power are the keynotes of the new Navy. The roots of the Navy lie in a strong belief in the future, in continued dedication to our tasks, and in reflection on our heritage from the past.

Never have our opportunities and our responsibilities been greater.

CONTENTS

SUMMARY OF BUILDER 3&2 RATE TRAINING MANUALS

VOLUME 1

Builder 3&2, Volume 1, NAVEDTRA 12520, is a basic book that should be mastered by those seeking advancement to Builder Third Class and Builder Second Class. The major topics addressed in this book include construction administration and safety; drawings and specifications; woodworking tools, materials and methods of woodworking; fiber line, wire rope, and scaffolding; leveling and grading; concrete; placing concrete; masonry; and planning, estimating and scheduling.

VOLUME 2

Builder 3&2, Volume 2, NAVEDTRA 12521, continues where Volume 1 ends. The topics covered in Volume 2 include floor and wall construction; roof framing; exterior and interior finishing; plastering, stuccoing, and ceramic tile; paints and preservatives; advanced base field structures; and heavy construction.

CHAPTER 1

CONSTRUCTION ADMINISTRATION AND SAFETY

Being a petty officer carries many inherent responsibilities. These include your personal obligation to be a leader, an instructor, and an administrator in all the areas of your rating-military, technical, and safety.

As a petty officer, you need to develop an ability to control the work performed by your workers, as well as to lead them. As you gain experience as a petty officer and increase your technical competence as a Builder, you begin to accept a certain amount of responsibility for the work of others. With each advancement, you accept an increasing responsibility in military matters and in matters relating to the professional work of your rate. As you advance to third class and then to second class petty officer, you not only will have increased privileges but also increased responsibilities. You begin to assume greater supervisory and administrative positions.

The proper administration of any project, large or small, is as important as the actual construction. This chapter will provide you with information to help you to use and prepare the administrative paperwork that you encounter as a crew leader or as a crewmember.

ADMINISTRATION

LEARNING OBJECTIVE: Upon completing this section, you should be able to identify crew leader responsibilities in preparing tool kit inventories, preparing supply requisitions, and submitting labor time cards.

Administration is the means a person or an organization uses to keep track of what's happening. It provides a means of telling others what's been done and planned, who's doing it, and what's needed. Administration ranges from a simple notebook kept in your pocket to filling out a variety of reports and forms. As a growing leader in the Navy, you must learn about and become effective in the use of both the tools of your trade and administrative tools. Once you become comfortable with these, you can be a successful administrator.

PLANNING WORK ASSIGNMENTS

For our purposes here, planning means the process of determining requirements and developing methods and schemes of action for performing a task. Proper planning saves time and money and ensures a project is completed in a professional manner. Here, we'll look at some, but not all, of the factors you need to consider.

When you get a project, whether in writing or orally, make sure you clearly understand what is to be done. Study the plans and specifications carefully. If you have any questions, find the answers from those in a position to supply the information you need. Also, make sure you understand the priority of the project, expected time of completion, and any special instructions.

Consider the capabilities of your crew. Determine who is to do what and how long it should take. Also, consider the tools and equipment you will need. Arrange to have them available at the jobsite at the time the work is to get under way. Determine who will use the tools and make sure they know how to use them properly and safely.

To help ensure that the project is completed properly and on time, determine the best method of getting it done. If there is more than one way of doing a particular assignment, you should analyze the methods and select the one most suited to the job conditions. Listen to suggestions from others. If you can simplify a method and save time and effort, do it.

Establish goals for each workday and encourage your crew to work as a team in meeting these goals. Set goals that keep your crew busy, but make sure they are realistic. Discuss the project with the crew so they know what you expect from them. During an emergency, most crewmembers will make an all-out effort to meet a deadline. But when there is no emergency, don't expect them to work continuously at an excessively high rate. Again, set realistic goals. Daily briefings of this type cannot be over-emphasized.

DIRECTING WORK TEAMS

After a job has been properly planned, it is necessary to carefully direct the job. This ensures it is completed on time and with the quality that satisfies both the customer and the crew.

Before starting a project, make sure the crew knows what is expected. Give instructions and urge the crew to ask questions on all points that are not clear. Be honest in your answers. If you don't have an answer, say so; then find the answer and get back to the crew. Don't delay in getting solutions to the questions asked. Timely answers keep projects moving forward. They also show the crew your concern for the project is as genuine as theirs.

While a job is under way, spot check to ensure that the work is progressing satisfactorily. Determine whether the proper methods, materials, tools, and equipment are being used. When determining the initial requirements, do so early enough so there are no delays. If crewmembers are incorrectly performing a task, stop them and point out the correct procedures. When you check crewmembers' work, make them feel the purpose of checking is to teach, guide, or direct—not to criticize or find fault.

Make sure the crew complies with applicable safety precautions and wear safety apparel when required. Watch for hazardous conditions, improper use of tools and equipment, and unsafe work practices. These can cause mishaps and possibly result in injury to personnel. There are no excuses for unsafe practices. Proper safety instructions and training eliminate the desire to work carelessly. When directing construction crews, practice what you preach.

When time permits, rotate crewmembers on various jobs. Rotation gives you the opportunity to teach. It also gives each crewmember an opportunity to increase personal skill levels.

As a crew leader, you need to ensure that your crew work together in getting the job done. Develop an environment where each crewmember feels free to seek your advice when in doubt about any phase of the work. Emotional balance is especially important. Don't panic in view of your crew or be unsure of yourself when faced with a conflict.

Be tactful and courteous in dealing with your crew. It sounds obvious, but don't show any partiality. Keep every crewmember informed on both work and personal matters that affect his or her performance. Also, try to maintain a high level of morale. Low morale has a definite effect on the quantity and quality of a crew's work.

As you advance in rate, you spend more and more time supervising others. You have to learn as much as you can about supervision. Study books on both supervision and leadership, Also, watch how other supervisors-both good and bad-operate. Don't be afraid to ask questions.

TOOL KIT INVENTORY

Tool kits contain all the craft hand tools required by one, four-member construction crew or fire team of a given rating to pursue their trade. The kits may contain additional items required by a particular assignment. However, they should not be reduced in type of item and should be maintained at 100 percent of kit assembly allowance at all times.

As a crew leader, you can order and are responsible for all the tools required by the crew. This incurs the following responsibilities:

- Maintaining complete tools kits at all times;
- Assigning tools within the crew;
- Ensuring proper use and care of assigned tools by the crew;
- Preserving tools not in use;
- Securing assigned tools; and
- Ensuring that all electrical tools and cords are inspected on a regular basis.

To make sure tools are maintained properly, the operations officer and the supply officer establish a formal tool kit inventory and inspection program. As a crew leader, you perform a tool kit inventory at least every 2 weeks. Tools requiring routine maintenance are turned in to the central tool room (CTR) for repair and reissue. Damaged or worn tools should be returned to the CTR for replacement. You must submit requisitions for replacement items.

Tool management is further specified in instructions issued by Commander, Construction Battalion, Pacific (COMCBPAC) and Commander, Construction Battalion, Atlantic (COMCBLANT).

PREPARING REQUISITIONS

As a crew leader, you must become familiar with the forms used to request material or services through the Navy Supply System. Printed forms are available that provide all the information necessary for the physical transfer of the material and accounting requirements. The form you will use most often is NAVSUP Form 1250, shown in figure 1-1.

Crew leaders are not usually required to complete the entire form. However, you must list the stock number of the item, when available, the quantity required, and the name or description of each item needed. Turn this form in to the expediter, who checks it, fills in the remaining information, and signs it. The form then goes to the material liaison officer (MLO) or supply department for processing.

In ordering material, you need to know about the national stock number (NSN) system. Information on the NSN system and other topics about supply is given in *Military Requirements for Petty Officer Third Class,* NAVEDTRA 12044.

TIMEKEEPING

In both battalion and shore-based activities, you will be posting entries on time cards for military personnel. You need to know the type of information called for on the cards and understand the importance of accuracy in labor reporting. The reportings systems used primarily in naval mobile construction battalions (NMCBs) and the system employed at shore-based activities are similar.

A labor accounting system is used to record and measure the number of man-hours a unit spends on various functions. Labor utilization information is collected every day in sufficient detail and manner to allow the operations department to readily compile the data. This helps the operations officer to both manage manpower resources and prepare reports for higher authority. Although labor accounting systems may vary slightly from one command to another, the system described here is typical.

Each work unit accounts for all labor used to carry out its assignment. This lets management determine the amount of labor used on the project. Labor costs are figured, and actual man-hours are compared with other similar jobs. When completed, unit managers and higher commands use this information to develop planning standards.

The type of labor performed must be broken down and reported by category to show how labor has been used. For timekeeping and labor reporting

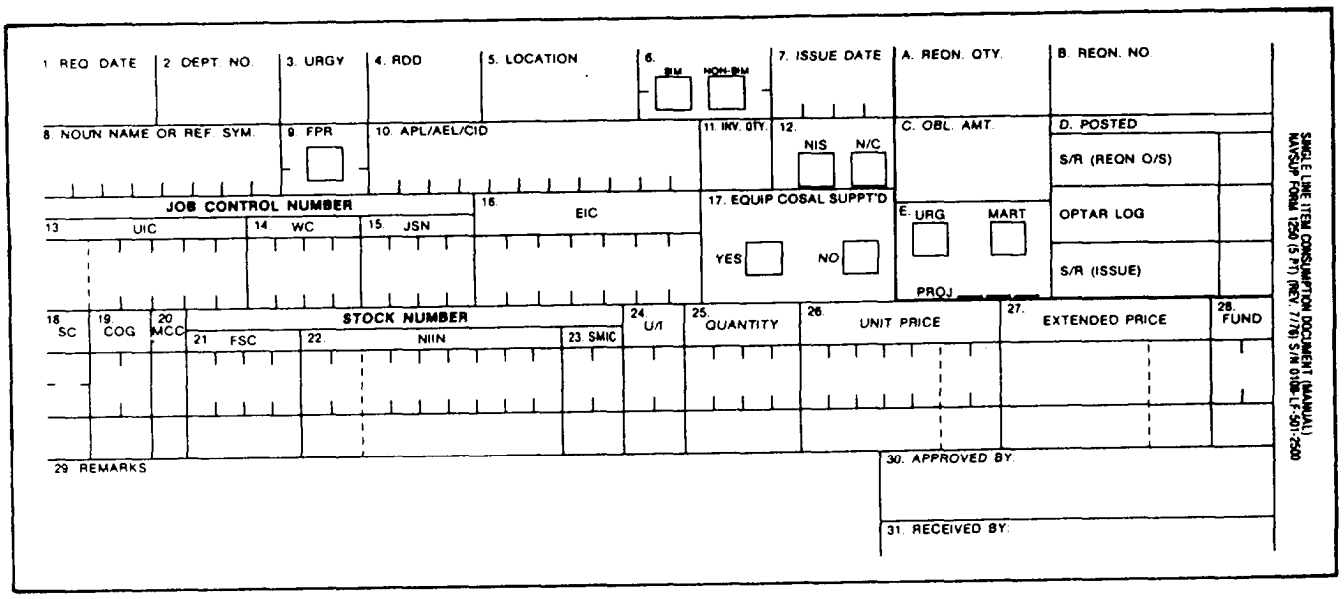


Figure 1-1.—NAVSUP 1250.

purposes, all labor is classified as either productive or overhead. Labor codes are shown in figure 1-2.

Productive labor either directly or indirectly contributes to the completion of the unit's mission, including construction operations and training. It is broken down into four categories: direct labor, indirect labor, military operations and readiness, and training.

Direct labor includes labor expended directly on assigned construction tasks contributing directly to the completion of an end product. It can be either in the field or in the shop. Direct labor must be reported separately for each assigned construction task. Indirect labor is labor required to support construction operations but not producing an end product itself.

Military operations and readiness includes work necessary to ensure the unit's military and mobility readiness. It consists of all manpower expended in actual military operations, unit embarkation, and planning and preparations.

Training includes attendance at service schools, factory and industrial courses, fleet-level training and short courses, military training, and organized training conducted within the battalion or unit.

Overhead labor, compared to productive labor, does not contribute directly or indirectly to the completion of an end product. It includes labor that must be performed regardless of the assigned mission.

During project planning and scheduling, each direct labor phase of the project is given an identifying code. For example, excavating and setting forms may be assigned code R-15; laying block, code R-16; and installing bond beams, code R-17. (Since there are many types of construction

PRODUCTIVE LABOR. Productive labor includes all labor that directly contributes to the accomplishment of the Naval Mobile Construction Battalion (NMCB), including construction operations and readiness, disaster recovery operations, and training.

DIRECT LABOR. This category includes all labor expended directly on assigned construction tasks, either in the field or in the shop, and which contributes directly to the completion of the end product.

INDIRECT LABOR. This category comprises labor required to support construction operations, but which does not produce in itself. Indirect labor reporting codes are as follows:

X01 Construction Equipment Maintenance, Repair and Records	X04 Project Expediting (Shop Planners)	X07 Tool and Spare Parts Issue
X02 Operation and Engineering	X05 Location Moving	X08 Other
X03 Project Supervision	X06 Project Material Support	

MILITARY OPERATIONS AND READINESS. This category comprises all manpower expended in actual military operations, unit embarkation, and planning and preparations necessary to insure unit military and mobility readiness. Reporting codes are as follows:

M01 Military Operations	M04 Unit Movement	M07 Military Administrative Functions	M09 Other
M02 Military Security	M05 Mobility Preparation	M08 Mobility & Defense Exercise	
M03 Embarkation	M06 Contingency		

DISASTER CONTROL OPERATIONS

D01 Disaster Control Operations D02 Disaster Control Exercise

TRAINING. This category includes attendance at service schools, factory, and industrial training courses, fleet type training, and short courses, military training, and organized training conducted within the battalion. Reporting codes are as follows:

T01 Technical Training	T03 Disaster Control Training	T05 Safety Training
T02 Military Training	T04 Leadership Training	T06 Training Administration

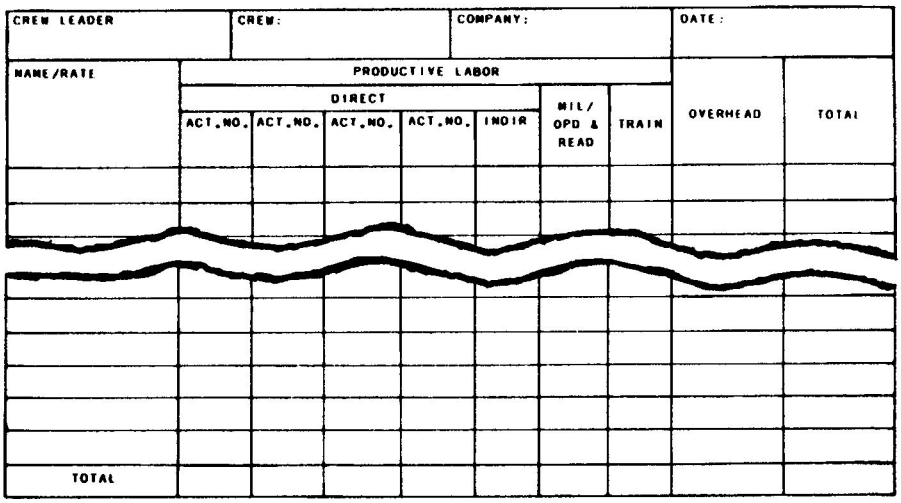
OVERHEAD LABOR. This category includes labor that must be performed regardless of whether a mission is assigned, and which does not contribute to the assigned mission. Reporting codes are as follows:

Y01 Administrative & Personnel	Y06 Camp Upkeep & Repairs	Y10 Personal Affairs
Y02 Medical & Dental Department	Y07 Security	Y11 Lost Time
Y03 Navy Exchange and Special Services	Y08 Leave & Liberty	Y12 TAD not for unit
Y04 Supply & Disbursing	Y09 Sickcall, Dental & Hospitalization	Y13 Other
Y05 Commissary		

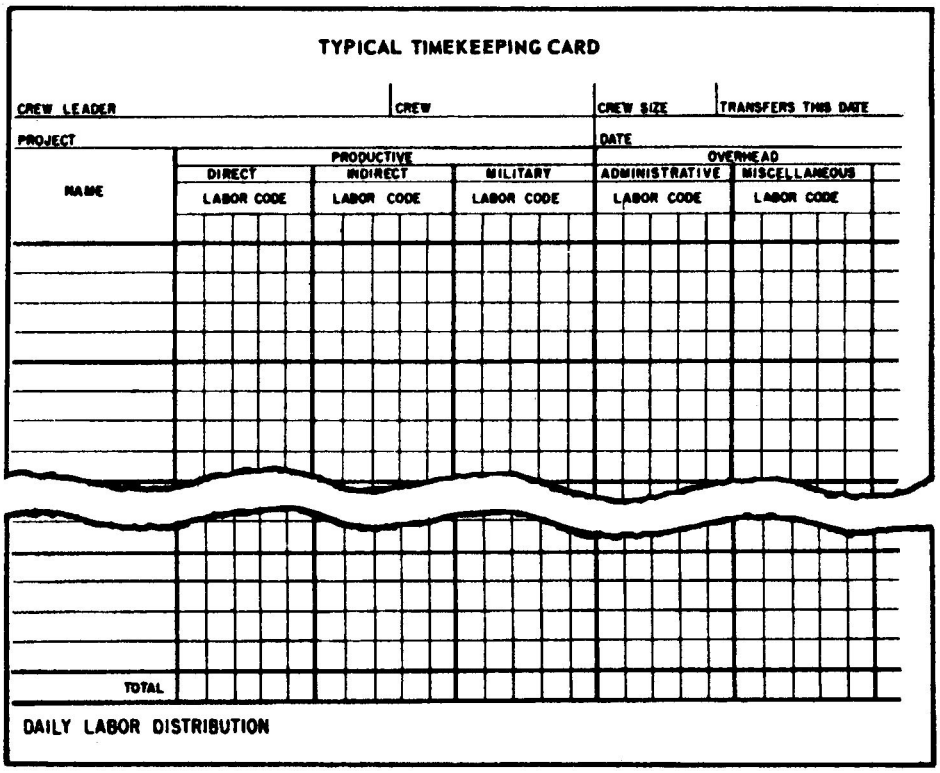
Figure 1-2.—Labor codes.

projects involving different operations, codes for direct labor may vary from one activity to another.) Use direct labor codes in reporting each hour spent by each of your crewmembers during each workday on an assigned activity code.

Submit your reports on a daily labor distribution report form (timekeeping card). Views A and B of figure 1-3 show typical timekeeping cards. The form provides a breakdown, by man-hours, of the activities in the various labor codes for each crewmember for each day on any given project. The form is reviewed at the company level by the staff and platoon commander. The company commander then initials the report and sends it to the operations department. The management division of the operations department tabulates the report, along with those received from all other companies and departments in the unit. This consolidated report is the means by which the operations office analyzes the labor



A.



B.

Figure 1-3.—Typical timekeeping cards (A and B).

distribution of total manpower resources for each day. It also serves as feeder information for preparing the monthly operations report, and any other source reports required of the unit. The information must be accurate and timely. Each level in the organization should review the report for an analysis of its own internal construction management and performance.

SAFETY PROGRAM

LEARNING OBJECTIVE: Upon completing this section, you should be able to describe the safety organization, function of the battalion or unit safety program, and the responsibilities of key personnel.

You must be familiar with the safety program at your activity. You cannot function effectively as a petty officer unless you are aware of how safety fits into your organization. You need to know who establishes and arbitrates safety policies and procedures. You should also know who provides guidelines for safety training and supervision. Every NMCB and shore command has a formal safety organization.

SAFETY ORGANIZATION

The NMCB's safety organization provides for the establishment of safety policy and control and reporting. As illustrated in figure 1-4, the battalion safety policy organization contains several committees: policy; supervisors'; and equipment, shop, and crew.

The executive officer presides over the safety policy committee. Its primary purpose is to develop safety rules and policy for the battalion. This committee reports to the commanding officer, who approves all changes in safety policy.

The battalion safety officer presides over the safety supervisors' committee. This committee includes safety supervisors assigned by company commanders, project officers, or officers in charge of a detail. Basically, it helps the safety officer manage an effective overall safety and health program. The committee provides a convenient forum for work procedures, safe practices, and safety suggestions. Its recommendations are sent to the policy committee.

The equipment, shop, and crew committees are assigned as required and are usually presided over by the company or project safety supervisor. The main

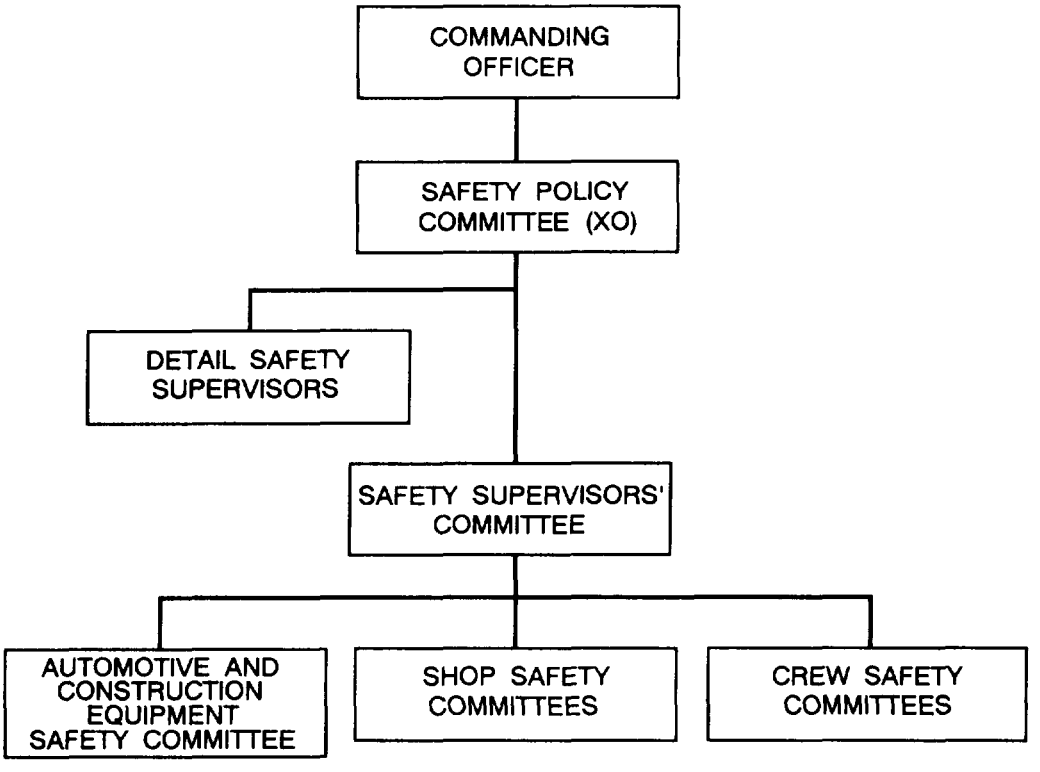


Figure 1-4.—NMCB safety policy organizaton.

objective of this committee is to propose changes in the battalion's safety policy to eliminate unsafe working conditions or prevent unsafe acts. It is your contact for recommending changes in safety matters. In particular, the equipment committee reviews all vehicle mishap reports, determines the cause of each mishap, and recommends corrective action. As a crew leader, you can expect to serve as a member. Each committee forwards reports and recommendations to the safety supervisors' committee.

SAFETY DUTIES

As a crew leader, you will report to the safety supervisor, who directs the safety program of a project. The safety supervisor is inherently responsible for all personnel assigned to that shop or project. Some of the duties include indoctrinating new crewmembers, compiling mishap statistics for the project, reviewing mishap reports submitted to the safety office, and comparing safety performances of all crews.

The crew leader is responsible for carrying out safe working practices. This is done under the direction of the safety supervisor or others in positions of authority (project chief, project officer, or safety officer). You, as the crew leader, ensure that each crewmember is thoroughly familiar with these working practices, has a general understanding of pertinent safety regulations, and makes proper use of protective clothing and safety equipment. Furthermore, you should be ready at all times to correct every unsafe working practice you observe, and report it immediately to the safety supervisor or the person in charge. When an unsafe condition exists, any crew or shop member can stop work until the condition is corrected.

In case of a mishap, make sure injured personnel get proper medical care as quickly as possible. Investigate each mishap involving crewmembers to determine its cause. Remove or permanently correct defective tools, materials, and machines. Do the same for environmental conditions contributing to a mishap. Afterward, submit required reports.

SAFETY TRAINING

New methods and procedures for safely maintaining and operating equipment are always coming out. You must keep up to date on the latest techniques in maintenance and operation safety and pass them on to your crewmembers. One method of keeping your crewmembers informed is by holding stand-up safety meetings before the day's work starts. As crew leader, you are responsible for conducting each meeting and passing on material from the safety supervisor, Information (such as the type of safety equipment to use, where to obtain it, and how to use it) is often the result of safety suggestions received by the safety supervisors' committee. Encourage your crew to submit ideas or suggestions. Don't limit yourself to just the safety lecture in the morning. Discuss minor safety infractions when they occur or at appropriate break times during the day. As the crew leader, you must impress safe working habits upon your crewmembers through proper instructions, constant drills, and continuous supervision.

You may hold group discussions on **specific mishaps** to guard against or that may happen on the job. Be sure to give plenty of thought to what you are going to say beforehand. Make the discussion interesting and urge the crew to participate. The final result should be a group conclusion as to how the specific mishap can be prevented.

Your stand-up safety meetings also give you the chance to discuss prestart checks, and the operation or maintenance of automotive vehicles assigned to a project. Vehicles are used for transporting crewmembers as well as cargo. It is important to emphasize how the prestart checks are to be made and how to care for the vehicles.

You can use a stand-up safety meeting to solve safety problems arising from a new procedure. An example might be starting a particular piece of equipment just being introduced. In this case, show the safe starting procedure for the equipment. Then, have your crewmembers practice the procedure.

Because of the variety of vehicles that may be assigned to a project, there is too much information and too man y operating procedures for one person to remember. You need to know where to look for these facts and procedures. For specific information on prestart checks, operation, and maintenance of each vehicle assigned, refer to the manufacturer's operator/maintenance manuals. In addition, personnel from Alfa Company (equipment experts) will instruct all personnel in the proper start-up procedures for new equipment.

In addition to stand-up safety meetings, conduct day-to-day instruction and on-the-job training. Although it is beyond the scope of this chapter to describe teaching methods, a few words on your

approach to safety and safety training at the crew level are appropriate. Getting your crew to work safely, like most other crew leader functions, is essentially a matter of leadership. Therefore, don't overlook the power of **personal example** in leading and teaching your crewmembers. They are quick to detect differences between what you say and what you do. Don't expect them to measure up to a standard of safe conduct that you, yourself, do not. Make your genuine concern for the safety of your crew visible at all times. Leadership by example is one of the most effective techniques you can use.

RECOMMENDED READING LIST

NOTE

Although the following references were current when this TRAMAN was published, their continued currency cannot be assured. You therefore need to ensure that you are studying the latest revision.

Naval Construction Force Manual, P-315, Naval Facilities Engineering Command, Washington, D.C., 1985.

Naval Construction Force Occupational Safety and Health Program Manual, COMCBPAC/COMCBLANTINST 5100.1F, Commander, Naval Construction Battalions, U.S. Pacific Fleet, Pearl Harbor, Hawaii, and Commander, Naval Construction Battalions, U.S. Atlantic Fleet, Naval Amphibious Base, Little Creek, Norfolk, Va., 1991.

Seabee Planner's Estimator Handbook, NAVFAC P-405, Naval Facilities Engineering Command, Alexandria, Va., 1983.